

Appln No. 10/796,225
Amdt date May 24, 2007
Reply to Office action of March 16, 2007

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the Specification.

Listing of Claims:

1. (Currently Amended) A method for driving a plasma display panel including a plurality of first electrodes and second electrodes provided in parallel on a first substrate, and a plurality of third electrodes crossing the first electrodes and second electrodes and being formed on a second substrate, wherein a plurality of discharge cells is formed by ~~adjacent~~ first electrodes, second electrodes, and third electrodes, and wherein a single subfield includes an address period for forming wall charges at a discharge cell to be selected from among the discharge cells, and a sustain period for discharging the selected cell, the method comprising:

in the sustain period:

applying a first pulse to a second electrode of the plurality of second electrodes while a first electrode of the plurality of first electrodes is established ~~[[as]]~~ at a first voltage; and

alternately applying to the first electrodes and the second electrodes a sustain pulse with a second voltage defined by a voltage difference between the first electrodes and the second electrodes,

wherein the second voltage is less than a voltage difference between the first pulse and the first voltage.

2. (Original) The method of claim 1, wherein the address period of the next subfield follows the sustain period.

3. (Original) The method of claim 1, wherein a discharge occurs at the discharge cell selected in the address period by the first voltage and the first pulse to form a first space charge and the first space charge allows the discharge cell to be discharged by the second voltage.

4. (Original) The method of claim 3, wherein the second voltage level is less than a discharge firing voltage level between the first electrodes and the second electrodes at a discharge cell that is not selected.

5. (Original) The method of claim 3, wherein the sustain pulse has a width such that the sustain pulse may generate and maintain a second space charge after a discharge has occurred in the selected discharge cell.

6. (Original) The method of claim 5, wherein the sustain pulse is applied to the one of the first electrodes and the second electrodes when the second space charge remains in the discharge cell such that the first electrode and the second electrode may be discharged by the second voltage.

7. (Original) The method of claim 3, wherein:
the sustain pulse comprises a second pulse that is applied to the first electrode and alternately has a third voltage and a fourth voltage, and a third pulse that is applied to the second electrode and alternately has a fifth voltage and a sixth voltage, and
a difference between the first voltage level and the fifth voltage level and a difference between the sixth voltage level and the fourth voltage level is defined as the second voltage level.

8. (Original) The method of claim 3, wherein:
the first pulse is a square wave with a third voltage level for a predetermined period, and
a difference between the third voltage level and the first voltage level is within a range for generating a discharge between the first electrode and the second electrode together with a voltage formed by the wall charges formed at the selected discharge cell.

9. (Original) The method of claim 8, wherein:

the predetermined period has an interval during which the charges formed by the discharge between the first and second electrodes may be accumulated at the first and second electrodes, and

when the first pulse falls from the third voltage, a discharge occurs in the discharge cell because of the charges accumulated at the first electrodes and second electrodes to form the first space charge.

10. (Original) The method of claim 8, wherein the predetermined period has an interval such that the charges formed by the discharge between the first electrodes and second electrodes may remain as the first space charge.

11. (Original) The method of claim 8, wherein a voltage difference between the third voltage level and the first voltage level is within a range during which a discharge between the first electrodes and second electrodes cannot occur at the discharge cell that is not selected during the address period.

12. (Original) The method of claim 3, wherein:
the first pulse is a waveform that gradually rises to the third voltage level,
a voltage difference between the third voltage level and the first voltage level is a voltage such that it may generate a discharge between the first electrodes and the second electrodes, and
when the first pulse falls from the third voltage level, a discharge occurs by the charges accumulated in the first electrodes and the second electrodes caused by the discharge between the first and second electrodes to form the first space charge.

13. (Original) The method of claim 12, wherein the first pulse is a linearly rising ramp waveform.

14. (Original) The method of claim 12, wherein the first pulse is a curvedly rising round waveform.

15. (Original) The method of claim 12, wherein a voltage difference between the third voltage level and the first voltage level is within a range during which a discharge between the first electrodes and the second electrodes cannot occur at the discharge cell that is not selected during the address period.

16. (Original) The method of claim 3, wherein the sustain pulse has a width such that wall charges may be formed at the first electrodes and the second electrodes after the discharge occurs at the selected discharge cell.

17. (Original) The method of claim 16, wherein the second voltage level is within a range for generating a discharge between the first electrodes and the second electrodes together with a voltage caused by the wall charges formed at the first and second electrodes.

18. (Original) The method of claim 17, wherein the last pulse applied to one of the first electrodes and the second electrodes in the sustain period has a width such that no wall charges may be formed at the first electrodes and the second electrodes.

19. (Currently Amended) A plasma display panel comprising:
a first substrate and a second substrate;
a plurality of first electrodes and second electrodes formed in parallel on the first substrate;
a plurality of third electrodes crossing the first electrodes and the second electrodes and being formed on the second substrate; and
a driving circuit for driving a single subfield through an address period for forming charges at a discharge cell to be selected from among a plurality of discharge cells formed by adjacent first electrodes, second electrodes, and third electrodes, and a sustain period for discharging the selected discharge cell,
wherein during the sustain period, the driving circuit applies a setup pulse to ~~[[a]]~~ the ~~second-electrode~~ electrodes while maintaining ~~[[a]]~~ the ~~first electrode~~ electrodes at a first voltage, and respectively applies first sustain pulses and second sustain pulses with

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predetermined frequencies to the first electrodes and the second electrodes ~~during the sustain period~~, and

the setup pulse generates a discharge between the first electrodes and the second electrodes at the selected discharge cell,

wherein the setup pulse has a waveform for generating a discharge between the first electrodes and the second electrodes at the selected discharge cell to form a first space charge,

a voltage level difference between the first sustain pulses and the second sustain pulses when the first sustain pulse has a high-level voltage and a voltage level difference between the second sustain pulses and the first sustain pulses when the second sustain pulse has a high-level voltage are a second voltage level, and

the second voltage level is within a range for establishing the first space charge as a priming particle to generate a discharge between the first and second electrodes.

20. (Cancelled)

21. (Currently amended) The plasma display panel of claim ~~[[20]]~~19, wherein, during the address period:

the driving circuit respectively applies fourth and fifth voltages to the second and third electrodes of the discharge cell to be selected while maintaining the first electrode at a third voltage,

a voltage difference between the fifth and fourth voltage levels is within a range for generating a discharge between the second and third electrodes, and

a voltage difference between the third and fourth voltage levels is within a range for establishing a discharge between the second and third electrodes as priming and generating a discharge between the first and second electrodes.

22. (Currently amended) The plasma display panel of claim ~~[[20]]~~19, wherein: the setup pulse is a square wave with a third voltage level,

a discharge between the first electrodes and the second electrodes occurs at the selected discharge cell when the square wave rises,

wall charges are formed at the first and second electrodes by the discharge between the first electrodes and the second electrodes while the square wave maintains the third voltage level, and

a discharge between the first electrodes and the second electrodes is generated by the wall charges formed at the first electrodes and the second electrodes when the square wave falls.

23. (Currently amended) The plasma display panel of claim ~~[[20]]~~19, wherein:
the setup pulse is a square wave with a third voltage level, and
the square wave has a width within a range where the charges formed by the discharge between the first electrodes and the second electrodes may remain as the first space charges at the selected discharge cell.

24. (Currently amended) The plasma display panel of claim ~~[[20]]~~19, wherein:
the setup pulse is a waveform gradually rising to the third voltage level,
a voltage difference between the third voltage levels and the first voltage levels is a voltage such that a discharge between the first electrodes and the second electrodes may occur at the selected discharge cell, and
a discharge occurs by the charges accumulated at the first electrodes and the second electrodes when the setup pulse falls to form the first space charges.

25. (Currently amended) The plasma display panel of claim ~~[[20]]~~19, wherein:
a period for forming the second voltage by the first sustain pulses and the second sustain pulses is within a range for forming a second space charge at the discharge cell by the discharge between the first electrodes and the second electrodes,
the second space charge is the second voltage formed by the level-converted first sustain pulses and the second sustain pulses to operate as a priming element for generating a discharge between the first electrodes and the second electrodes, and

frequencies of the first sustain pulses and the second sustain pulses are within a range where the second space charges remain such that the second space charges may operate as a priming element of a discharge between the first electrodes and the second electrodes.

26. (Currently amended) The plasma display panel of claim ~~[[20]]~~19, wherein:
a period for forming the second voltage by the first sustain pulses and the second sustain pulses is within a range for forming wall charges at the first electrodes and the second electrodes by the discharge between the first electrodes and the second electrodes, and

a discharge between the first electrodes and the second electrodes occurs by a voltage formed by the wall charges and the second voltage formed by the level-converted first sustain pulses and the second sustain pulses.

27. (Original) The plasma display panel of claim 26, wherein the last pulse applied to one of the first electrodes and the second electrodes has a width of a range during which no wall charges are formed at the first electrodes and the second electrodes by the discharge between the first electrodes and the second electrodes, during the sustain period.

28. (Original) A plasma display panel driving method by forming wall charges at a discharge cell to be selected from among a plurality of discharge cells, and discharging the selected discharge cell, comprising:

applying a setup pulse for forming a first space charge at a selected discharge cell to the discharge cell; and

establishing the first space charge formed by the setup pulse as a priming element, and applying a sustain pulse with a voltage level of a range for discharging the selected discharge cell to the discharge cell.

29. (Original) The plasma display panel driving method of claim 28, wherein:
the sustain pulse has a width of a range for forming a second space charge after the selected discharge cell is discharged by the sustain pulse, and

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the second space charge formed by the sustain pulse is set as a priming element, a level of the sustain pulse is converted, and the level-converted sustain pulse is applied to the discharge cell within a range where the second space charges remain so that the selected discharge cell may be discharged.

30. (Currently Amended) A plasma display panel driving method by dividing a frame for realizing video signals into a plurality of subfields, the plasma display panel including a plurality of discharge cells, wherein a subfield includes an address period for forming wall charges at a discharge cell to be selected from among the discharge cells, and a sustain period for sustaining the selected discharge cell without using a memory function, the method comprising:

in the sustain period:

applying a pulse for discharging the selected discharge cell ~~during the address period~~ to the discharge cells to generate priming; and

~~establishing the discharge as priming, and applying a sustain pulse for alternately sustaining to the discharge cell~~ to sustain the selected discharge cell by using the priming.

31. (Original) The plasma display panel driving method of claim 30, wherein an address period of a next subfield follows the sustain period of a subfield.

32. (Currently Amended) A plasma display panel comprising:

a first substrate and a second substrate;

a plurality of first electrodes and second electrodes formed in parallel on the first substrate;

a plurality of third electrodes crossing the first and second electrodes and being formed on the second substrate; and

a driving circuit for sustaining a plurality of discharge cells formed by adjacent first electrodes, second electrodes, and third electrodes,

wherein a frequency of the sustain pulse supplied for sustaining the discharge cell in the driving circuit is greater than 500KHz and less than or equal to 1MHz.

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33. (Cancelled)

34. (Currently Amended) The plasma display panel of claim ~~[[33]]~~32, wherein the frequency has a range from 700KHz to 1MHz.